



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,113	12/11/2003	Terence Quintin Collier		7899

7590 03/21/2007
Terence Quintin Collier
1910 Sunset Hill
Rowlett, TX 75088

EXAMINER

SHECHTMAN, SEAN P

ART UNIT	PAPER NUMBER
----------	--------------

2125

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/733,113

Applicant(s)

COLLIER, TERENCE QUINTIN

Examiner

Sean P. Shechtman

Art Unit

2125

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 11-20 are presented for examination. Claims 1-10 have been withdrawn from further consideration.

Election/Restrictions

2. Applicant's election of claims 11-20 in the reply filed on July 13th 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Oath/Declaration

3. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the mailing address of each inventor. A mailing address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing address should include the ZIP Code designation. The mailing address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76.

It does not identify the city and either state or foreign country of residence of each inventor. The residence information may be provided on either an application data sheet or supplemental oath or declaration.

Drawings

4. The drawings are objected to under 37 CFR 1.83(b) because they are incomplete. 37 CFR 1.83(b) reads as follows:

When the invention consists of an improvement on an old machine the drawing must when possible exhibit, in one or more views, the improved portion itself, disconnected from the old structure, and also in another view, so

Art Unit: 2125

much only of the old structure as will suffice to show the connection of the invention therewith.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to because Figs. 1 and 3 are partial views and partial views intended to form one complete view, on one or several sheets, must be identified by the same number followed by a capital letter in accordance with 37 CFR 1.84(u)(1). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from

Art Unit: 2125

the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

6. The drawings are objected to because the drawings do not show every feature of the invention specified in the claims. 37 CFR 1.81(b) states that drawings may include illustrations which facilitate an understanding of the invention (for example, flowsheets in cases of processes), and the examiner respectfully suggests the use of a flowsheet in the case of the process claims 11-20. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet"

Art Unit: 2125

or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

7. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are: "This two piece unit" (page 11, paragraph 46); "come in at a right and to the centerline" (page 12, paragraph 49); "Reliable and repeatable results are thus obtained since no electrical contact is required to since the surface that will tend to have a thin layer of non-conducting materials" (page 13, paragraph 52); "BCF" (page 14, paragraph 55); "CVI" (Page 14, paragraph 55); "This tool is capable" (Page 15, paragraph 58); "The limit is the imagination" (page 15, paragraph 58); "When required to evaluate and isolate contaminant and corrosive layers on BUMP's or pads, this invention is the tool" (Page 15, paragraph 58); "This feature" (page 15, paragraph 58); "SPM" (Page 17, paragraph 63); "AFM" (page 17, paragraph 63); "STM" (Page 17, paragraph 63); "Typical tools are both too large to accurately measure one bump without impacting adjacent bumps thereby skewing the data" (page 17, paragraph 65); "CTE" (page 19, paragraph 68); "DOE's" (Page 24, paragraph 79).

8. The disclosure is objected to because of the following informalities: Referring to the last line of paragraph 44 on page 11, it appears that the phrase "Similarly, the" should be the beginning of the first line of paragraph 45 on page 11. Referring to page 18, paragraph 66, it

appears that the last phrase of the paragraph should be the beginning of the first sentence of the next paragraph. Appropriate correction is required.

9. An examination of this application reveals that portions of the detailed description of the preferred embodiments, regarding references to specific related art and problems involved in the prior art which are solved by the applicant's invention, would be more appropriately placed in the background of the invention. Similarly, portions of the detailed description of the preferred embodiments, regarding how the invention solves problems previously existent in the prior art, would be more appropriately placed in the summary of the invention. See the guidelines below.

Content of Specification

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.
- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).
- (e) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.
- (f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:

Art Unit: 2125

- (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."
- (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."
- (g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.
- (h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.
- (j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).

Art Unit: 2125

- (k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).
- (l) Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

10. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested:

Method for measuring electrical, mechanical and electromechanical properties.

11. The examiner has provided a number of examples of the specification deficiencies in the above, however, the list of deficiencies may not be all inclusive. Applicant should refer to these as examples of deficiencies and should make all necessary corrections to eliminate the specification objections.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 11-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11 recites the limitation "the results" in line 6. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination it will be assumed that "the

Art Unit: 2125

results” are “the resultant captured data”. Claims 12-20 depend from claim 11 and therefore inherent the same deficiencies and assumptions.

Referring to claims 13-18 and 20, line 1 recites the limitation “the tool”, however claims 13-18 and 20 depend from claim 11, and claim 11 recites the limitations of “tools”. Therefore the recitation of “the tool” in the same or subsequent claim is unclear because it is uncertain which of the tools was intended (MPEP 2173.05(e)). For purposes of examination and in view of the instant specification, it will be assumed that “the tool” is “a tool”.

Claim 15 recites the limitation “the probe needle” in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination it will be assumed that “the probe needle” is “a probe needle”.

Claim 17 recites the limitation “the probe or target” in line 2. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination it will be assumed that “the probe or target” is “a probe or target”.

Claim 18 recites the limitation “the deformation or fracture” in line 2. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination it will be assumed that “the deformation or fracture” is “a deformation or fracture”.

Claim 19 recites the limitation “the surface and subsurface layers” in line 2. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination it will be assumed that “the surface and subsurface layers” is “a surface and subsurface layers”.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2125

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 11, 12, 14, 16-20 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 6,053,034 to Tsui et al (hereinafter referred to as Tsui).

Referring to claim 11, Tsui teaches

using load or displacement controlled tools and features (Fig. 1, Col. 5, lines 2-34);

capturing data for modeling (Col. 6, lines 49-50; Col. 7, lines 12-29, tensile stress can be calculated as a function of indenter displacement using a model) and simulation (Abstract, lines 13-15, toughness is calculated based on the value of the load and penetration using finite element analysis; Col. 11, lines 27-28); and

implementing change based on the resultant captured data (Col. 1, line 50 – Col. 2, line 4, nanoindentation measurements allow mechanical properties of the thin film to be mapped with submicron resolution to identify problem regions, which allows adjustments to be made to solve the problems in those regions; or Col. 7, lines 55-64, if the toughness, determined from the value of the load, does not meet required specifications, the device is tagged as defective and further expensive processing is not wasted on the defective device).

12. The method according to claim 11 is to use in-line load and displacement controlled tool (Col. 7, lines 57-58) with indenter blanks and probe needles (Col. 6, lines 55-58; Abstract, lines 9-10, indenter penetrates) to gather real-time mechanical data (Col. 5, lines 29-32; Col. 7, lines 46-52, toughness; Col. 12, lines 16-19).

14. The method according to claim 11 where a tool generates surface morphology data (Col. 5, lines 53-57).

16. The method according to claim 11 where a tool is used to review probe material to target material interactions (Col. 6, lines 41-54).

17. The method according to claim 11 where a tool is used to capture optical images of a target for evaluation and improvement (Col. 5, lines 53-57; Col. 7, lines 37-45; Col. 7, lines 55-64).

18. The method according to claim 11 where a tool is used to analyze a fracture of a target site (Col. 10, lines 3-25).

19. The method according to claim 11 where the resultant captured data are used to analyze a surface and subsurface layers (Col. 2, lines 61-65) to suggest improvement (Col. 7, lines 46-64, if the real-time toughness, determined from the captured data, does not meet required specifications, the device is tagged as defective and further expensive processing is not wasted on the defective device).

20. The method according to claim 11 where a tool can be used in-line (Col. 7, lines 57-58) to provide real time feedback to process owners (Col. 7, lines 46-64, if the real-time toughness, determined from the captured data, does not meet required specifications, the device is tagged as defective and further expensive processing is not wasted on the defective device).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2125

14. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsui as applied to claim 11 above, and further in view of U.S. Pat. No. 5,866,807 to Elings et al (hereinafter referred to as Elings).

Referring to claim 15, Tsui fails to teach a tool is used to verify the strength of a probe needle.

However, referring to claim 15, Elings teaches a tool (Col. 10, lines 2-5) is used to verify the strength of a probe needle (Fig. 3, elements 3-3 to 3-5, Col. 10, lines 5-10, tip and sample are forced against each other and if cantilever deflection reaches a predetermined deflection (force) which is interpreted as a strength, indenting operation is complete).

Tsui and Elings are analogous art because they are from the same field of endeavor, measuring mechanical properties on a small scale.

Therefore, it would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify the method of Tsui with the force verification technique of Elings that indicates an indenting operation is complete.

One of ordinary skill in the art would have been motivated to combine these references because Elings teaches that the deflection of the cantilever can be measured relative to a zero force value for deflection, and thus, the deflection of the cantilever due to contact with the surface can be more accurately known which allows more accurate force to be applied (Col. 4, lines 20-32).

Art Unit: 2125

15. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsui as applied to claim 11 above, and further in view of U.S. Pat. No. 4,776,202 to Brar et al (hereinafter referred to as Brar).

Referring to claim 13, Tsui fails to teach a tool is used to simulate electrical probing, mechanical stresses or environment factors on one or more target specimens.

However, referring to claim 13, Brar teaches a tool is used to simulate mechanical stresses or environment factors on one or more target specimens (Col. 1, lines 50-60).

Tsui and Brar are analogous art because they are from the same field of endeavor, measuring surface properties of a material.

Therefore, it would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify the method of Tsui with the tester of Brar.

One of ordinary skill in the art would have been motivated to combine these references because Brar teaches methods of using a tester that can simulate the contacting of material from mechanical stresses or environment factors (Col. 1, lines 16-19) for determining the maximum kinetic energy that a thin layer of material can withstand (Col. 4, lines 45-48).

Conclusion

16. The prior art or art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents or publications are cited to further show the state of the art with respect to indenter blanks and probe needles.

U.S. Pat. No. 4,888,982 to Chilton et al (Col. 3, lines 19-32).

Art Unit: 2125

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean P. Shechtman whose telephone number is (571) 272-3754.

The examiner can normally be reached on 9:30am-6:00pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo P. Picard can be reached on (571) 272-3749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SPS

Sean P. Shechtman *Sean Shechtman*

March 18, 2007 *3/18/07*